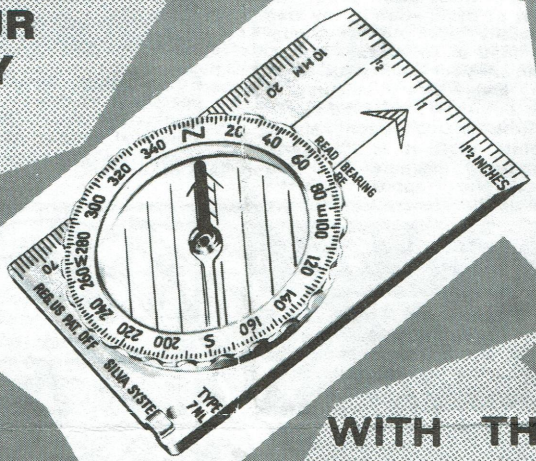
HOW TO FIND YOUR WAY



WITH THE SILVA COMPASS

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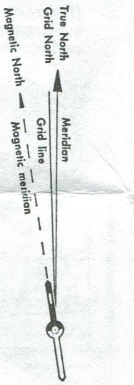
SILVA-SYSTEM COMPASSES are patented in most countries. U. S. patents Nos. 2136970, 2019411, 2331747 and Patents applied for.

INSTRUCTIONS FOR USE

The instructions given here are intended to aquaint you with some general terms and rules as well as the basic parts and functions of your Silva System Compass.

A BEARING is a horizontal angle fixing a direction in respect to North.

A bearing, from one point to another, can be fixed **either** on the map (where direction North is marked by Meridians or Grid lines) — a map bearing, **or** in the field (where direction North is pointed out by the magnetic needle) — a field bearing.



A MAP BEARING is either a **True Bearing** or a **Grid Bearing.**

A FIELD BEARING is a **Magnetic Bearing** also called a **Compass Bearing.**

TWO EXACTLY OPPOSITE SETS OF RULES APPLY TO THE USE OF A MAGNETIC COMPASS:

MAP BEARING RULES (see col. 7—11) apply if you are working **"from map to terrain".**

Here map is broadly interpreted also to include charts, descriptions and even a mental knowledge of the terrain. In general, if you are seeking a spot or a direction on the terrain from printed or mental information available to you, then the set of rules "from map to terrain" will apply. Learn them first thoroughly.

FIELD BEARING RULES (see col. 19—23) apply if you are working "from terrain to map". For instance, if you see some object on the terrain and wish to plot its location or determine the bearing to it, then the set of rules, "from terrain to map" will apply. Don't forget that they are exactly opposite to the other set of rules.

When you have learned **the map bearing** rules, you can reverse the procedure to practise **the field bearing rules.**

THE PARTS OF THE SILVA COMPASS

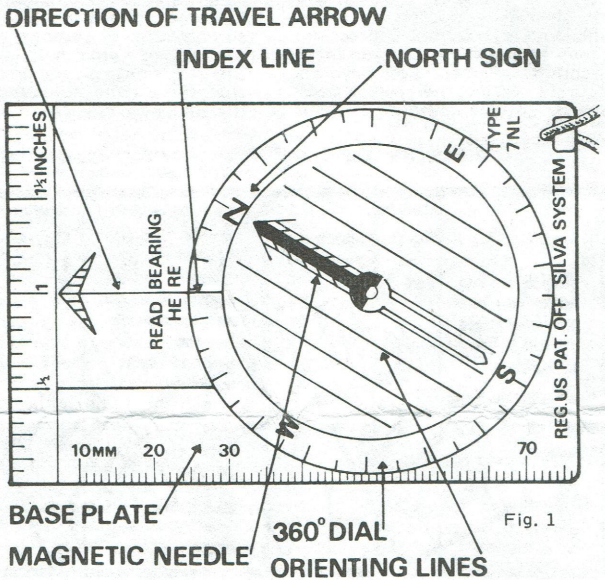


Fig. 1

MAP BEARING RULES

SETTING A BEARING

is to turn the dial until the bearing (the degree number or the compass point) you desire is shown at the index pointer.

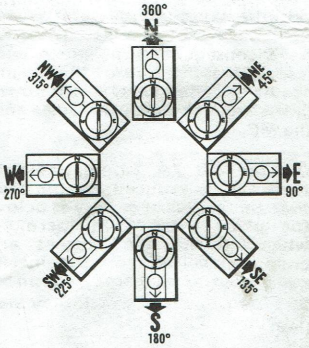


Fig. 2

The points of the compass are the cardinal (North, East, South, West) or intercardinal (NE, SE, SW and NW) directions.

The general principles outlined in these instructions apply to all SILVA-SYSTEM compasses, such as the liquid-filled Silva Explorer, Silva Voyager and Silva Ranger models. For a more thorough study of maps and compasses, one book recommended is "Be Expert with Map and Compass" by Bjorn Kjellstrom.

FACING A BEARING

Let us assume the bearing is set for 60 degrees.

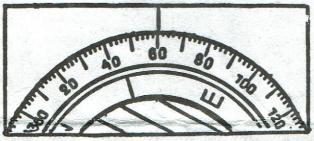


Fig. 3

1. Hold compass in your hand level enough to permit magnetic needle to swing freely, and also having direction arrow pointing straight ahead.

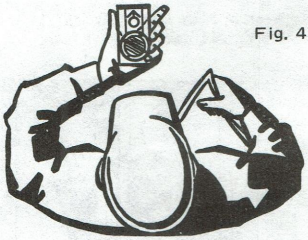


Fig. 4

2. Orient the compass (and yourself) as follows: while holding compass

as in above paragraph, turn yourself around together with the compass until the red north end of the magnetic needle points to the letter "N" on he dial.

3. Now look up in the direction of the direction of travel arrow — you are facing "bearing 60 degrees"!

TO WALK A BEARING

Look straight ahead (the farther the better) and choose a landmark or a spot which is in the direction you are facing, as pointed out by the direction of travel arrow on the compass. Walk to that landmark or spot without looking at the compass. When you get there, repeat the procedure, use the compass to locate next landmark in the bearing 60 degrees and repeat again until you reach your destination.

A REAL COMPASS WALK!

Check your knowledge of the foregoing procedure by trying a simple test in your garden or local park.

Place a coin or a marker on the ground between your feet. Set your Silva Compass for an arbitrary direction between 0 and 120 degrees, e. g. 40 degrees as shown. Face this bearing as instructed in column 8 and walk this bearing for 40 steps-stop!

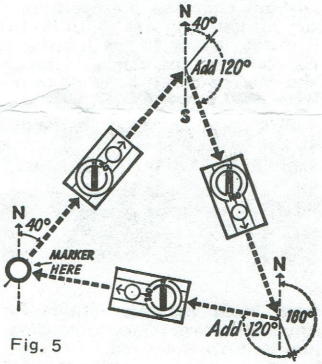


Fig. 5

Look at your compass again. Add 120 to your original 40 degrees — making it 160 degrees. Set this new bearing on your compass. Face this bearing by means of the compass (column 8), walk the new bearing of 160 degrees for 40 steps — and stop. Again, add 120 degrees to your last setting of 160 degrees — making it 280 degrees. Reset your compass, determine the new direction to walk and take 40 steps in the direction towards which the direction of travel arrow points now. Stop!

Your coin or marker should be right at your feet if you have used your SILVA Compass properly and your walking was exact. If you did not succeed, try it again with another bearing at the start and add 120 degrees at each of the two turns, walking the same distance in each direction. You will succeed in finding your starting point — and this test is very good practice.

Also, let your friends try it! It can be a very enjoyable "garden-party-game".

THE MAP AND THE SCALE

Each map is like an aerial photograph of the terrain taken from high above and reduced to an accurate scale. When we say the map is made on the scale of 1:10.000 (one to ten thousand) it means that one unit on the map represents 10,000 units on the ground.

Note the scale on your own maps and learn what distances such units as 1 inch, 1/2 inch etc. (1, 2 mm, etc.) represent over the ground. An index like this of your own can be useful.

THE SILVA SYSTEM — is simple as one, two and three!

The point you want to reach will not always lie exactly on a cardinal or intercardinal direction; it may be anywhere between these directions. Unless you have an accurate bearing, therefore, a small lake or cottage could be difficult to locate, Here your SILVA System Compass — **in reality a combination of compass and protractor** — is a great help and solves the problem in a very simple way. Just three hand adjustments and the line of travel (the bearing) is transferred from map to compass which then is ready to show you the way. A "flash" lesson in the Silva System is given on these columns.

COMPASS ON MAP

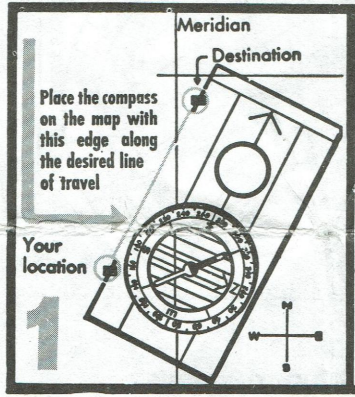


Fig. 6

COMPASS ON MAP

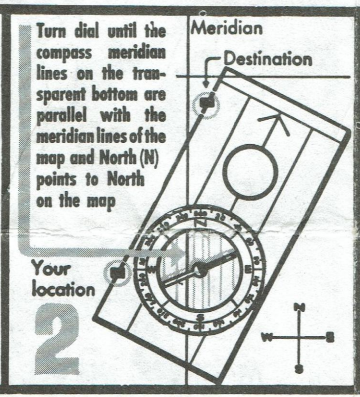

Meridian
Destination
Turn dial until the compass meridian lines on the transparent bottom are parallel with the meridian lines of the map and North (N) points to North on the map
Your location
2

Fig. 7

COMPASS REMOVED FROM MAP (See fig. 4)

Without changing the dial setting turn the entire compass horizontally until the red end of the magnetic needle points to North (N) and is parallel with the orienting lines
3
Just follow the direction of travel arrow!

Fig. 8

MAGNETIC DECLINATION

(Sometimes called magnetic variation) is the angle between True North and Magnetic North. Maps are practically always based on True North which is static (see col. 3). A compass needle which is attracted by the magnetism of the earth, always points to **Magnetic North** — at least if it is not disturbed by nearby iron or steel objects.

When using the compass, keep it well clear of metallic objects, (knives, photo meters, lighters, even belt buckles); they can cause serious inaccuracies.

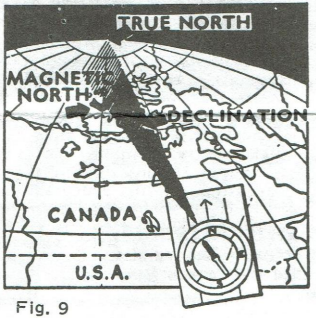


Fig. 9

The Magnetic North is located in the upper Hudson Bay area (Fig. 9) but moves slightly from year to year. **Information about the amount of declination in any area is generally given on the topographic map of this area.** If not, you can ask your county surveyor. At any area where your compass needle points East of True North it is **"Easterly Declination"**, and if it points West it is **"Westerly Declination"**. Where True and Magnetic North appear to be the same it is zero line.

ADJUSTING MAP BEARINGS FOR DECLINATION

When the compass is used with a map or in connection with map bearings, an adjustment should be made to allow for the declination. This is especially important if there is considerable declination in your area or if accuracy is quite important. With one turn of the dial you can make the proper allowance for any declination.
You must do this every time you wish to apply a declination to a bearing. Here is how:

First find out the amount of declination in your area.
Second, turn the dial as per the following rule:

FROM MAP TO TERRAIN
Declination West, turn dial West
Declination East, turn dial East
FROM TERRAIN TO MAP
Reverse the step!

For example, assume your map bearing is 14 degrees (fig. 10) and declination is 10 degrees West. Turn dial West 10 degrees (ADD). It will then read 24 degrees (fig.11)

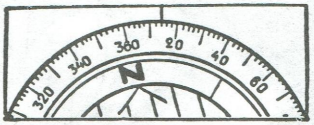


Fig. 10

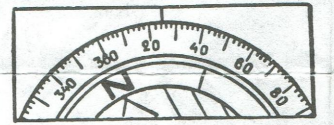


Fig. 11

Conversly, if the declination was shown as 10 degrees East. Turn dial East 10 degrees (SUBTRACT) and it will then read 4 degrees.

Note. When you have made this allowance for declination you can face or follow an accurate magnetic bearing (see col. 8 and 9).

DECLINATION CAN BE IGNORED

when the compass is used without reference to maps, so that its use is based on field bearings exclusively. Also for rough compass work where accuracy is not too important, especially in areas where the declination is not great.

FIELD BEARING RULES

Working from Terrain to Map is achieved simply by reversing the Map to Terrain rules you have already learned.

TAKING A FIELD BEARING

1. Face the landmark (hill, buildings, etc.) on which you intend taking a bearing, either to plot on your map, or to give you a course to follow.

2. Hold your compass with the direction of travel arrow pointing to the actual landmark and level enough to permit the needle to swing freely (fig. 4).

3. Turn the dial of the housing — without changing the position of the whole compass — until the orienting arrow in the housing is parallel with the magnetic needle and the red end is pointing to the letter "N" (fig. 8).

4. Now you can read on the dial at the index pointer the magnetic bearing to the actual landmark.

ADJUSTING FIELD BEARINGS FOR DECLINATION

Read again the instructions for adjusting map bearings for declination and do the same, but don't forget to "reverse the step"! That means that for declination West you now turn dial East (SUBTRACT) and for declination East you turn dial West (ADD) the amount of declination degrees. When a proper allowance for declination is made your compass will show the true bearing, and you can use it to plot on the map either the location of the object, which you have determined the bearing to or the location of yourself.

PLOTTING LOCATIONS (resection)

Fig. 12

Assume you want to plot on to your map the spot where you are standing in fig. 12. Your map is fig. 13.

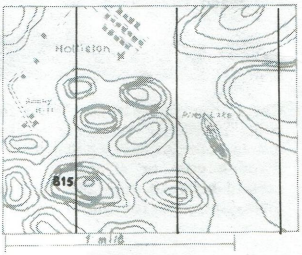


Fig. 13

A good method for doing this is by means of "cross-bearings" to two previously plotted locations (a re-section). Your first job is to find two spots on the map which you recognize on the terrain. You deduce that the church is in the village of Holliston, and the lake must be Pike Lake. These, then are the chosen two points from which to take crossbearings. Proceed as follows:

1. Take a field bearing to the church and adjust for declination.

2. Put the compass on the map so that either side of the base plate intersects the symbol for the church at Holliston, and while keeping the edge of the compass' base plate on the symbol of the church, turn entire compass on the map until the compass orienting lines are parallel with the meridian lines on the map, and so that the orienting arrow points North on the map (fig. 14).

3. Draw a line on the map along the edge of the compass, intersecting the symbol for the church. Your position is somewhere along this line.

4. To establish your position along this line, you repeat the same procedure, but now you use the North end of Pike Lake as the object for this bearing. When you have drawn the line from Pike Lake you will find your exact position where the two lines cross — hill 815 (fig. 15).

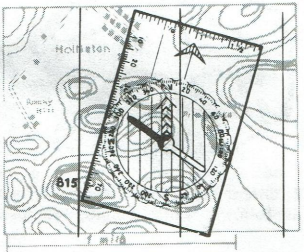


Fig. 14

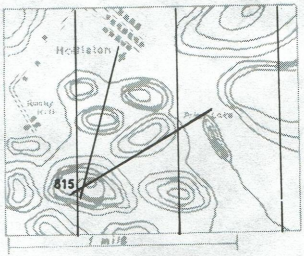


Fig. 15

MAGNETIC INCLINATION
Important for globetrotters

The directions of the lines of the magnetical force vary from straight vertical at the magn. poles to horizontal only at an irregular line encircling the earth in the neighborhood of the equator. This line is called the magnetic equator (ME).

As a consequence the north end resp; the south end of the magn. needle has a tendency to dip down in the areas between the poles and the ME.

On the SILVA Compasses this tendency is reduced by the fact that the center of gravity is below the pivot point. Furthermore when needed, the needles are counter-balanced for the magn. zone (a latitudinal area of approx. 20° to 40°) within which they are expected to be used.

In case you as a globetrotter need a SILVA Compass balanced for other latitudes, the SILVA retailer or distributor is certainly prepared to advise you how to get it.